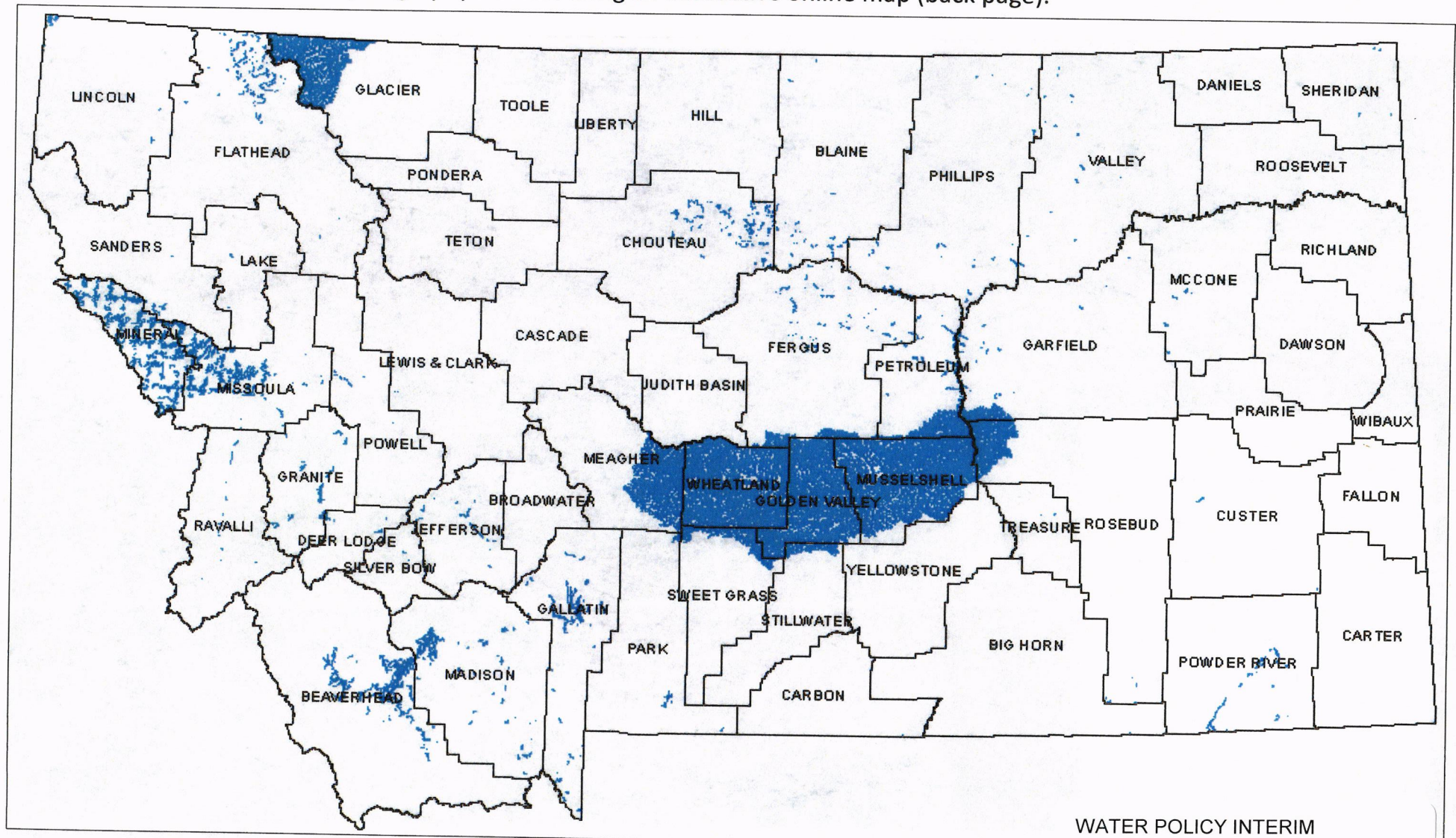


1. Montana Hydrography Dataset

The Montana State Library maintains and updates a statewide digital representation of the State's streams, rivers, and waterbodies. Over the past year, over 40,000 revisions have been made to this GIS database. The public can submit revisions to the Montana Hydrography Dataset using an interactive online map (back page).



WATER POLICY INTERIM
COMMITTEE 2017-18

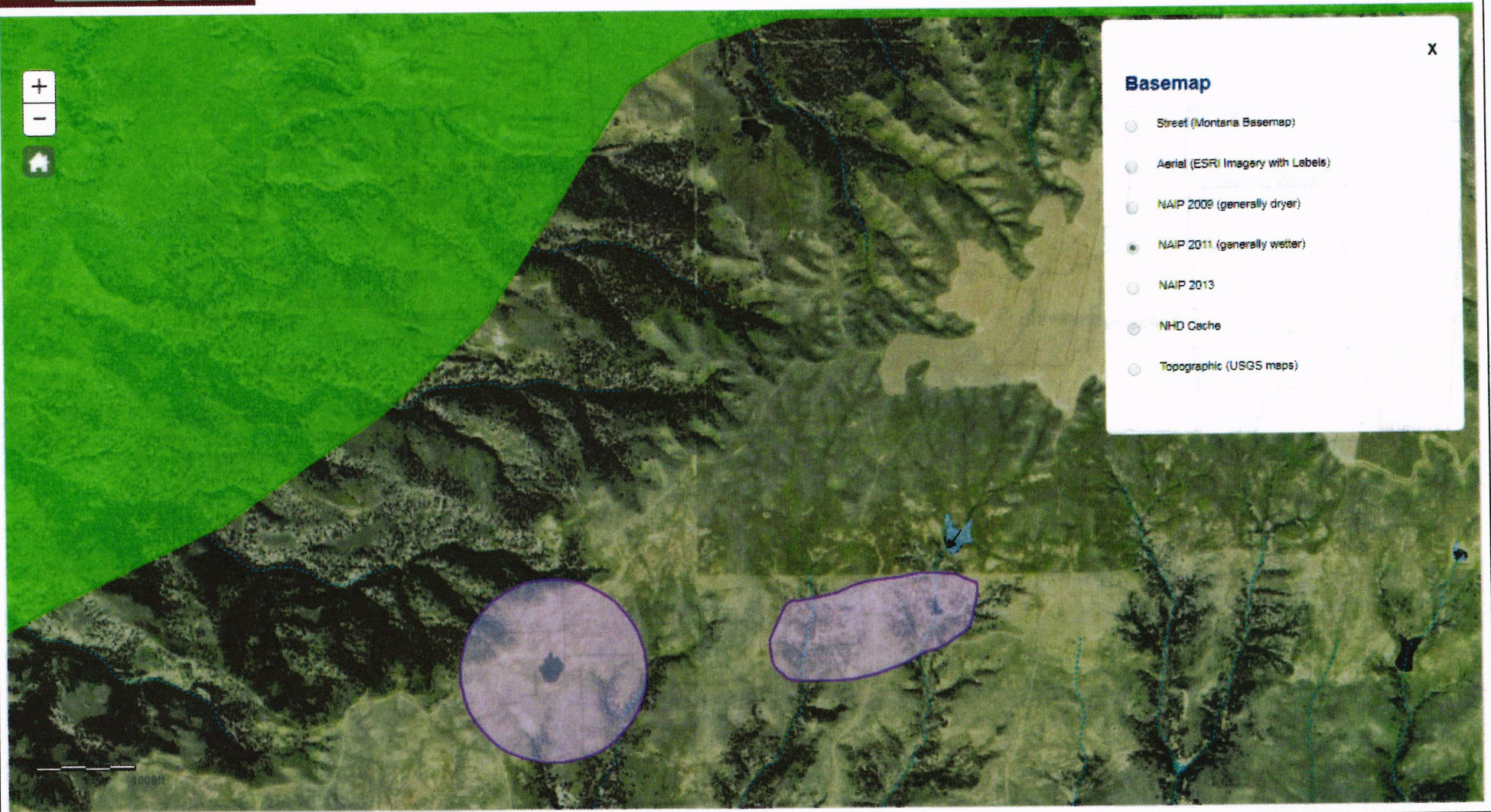
<http://nris.mt.gov/water>

January 9, 2018

Exhibit 16

Draw Freehand Polygon Circle Arrow

Layers Basemap Measure Print View Legend

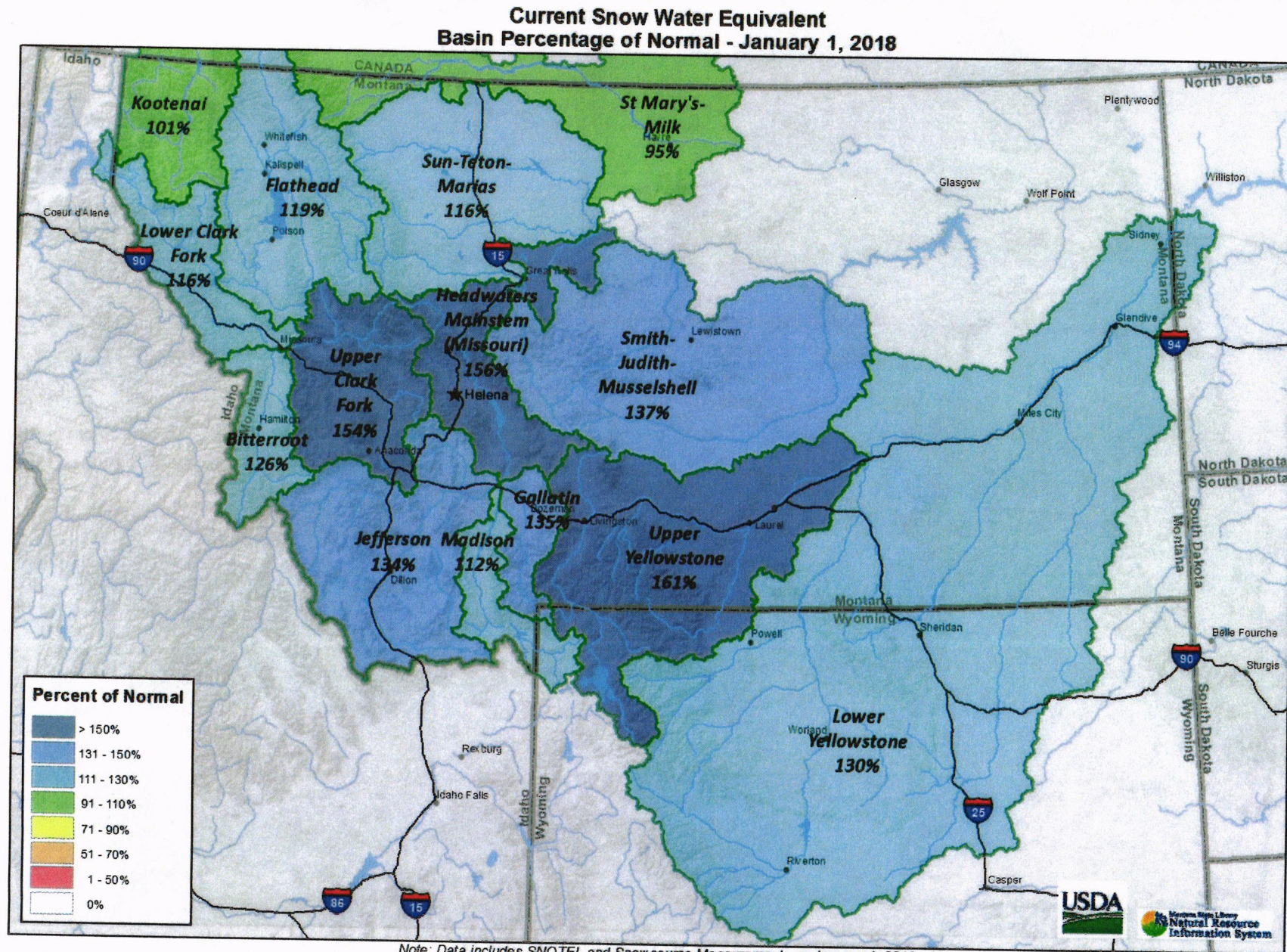


Basemap

- ☐ Street (Montana Basemap)
- ☐ Aerial (ESRI Imagery with Labels)
- ☐ NAIP 2009 (generally dryer)
- ☒ NAIP 2011 (generally wetter)
- ☐ NAIP 2013
- ☐ NHD Cache
- ☐ Topographic (USGS maps)

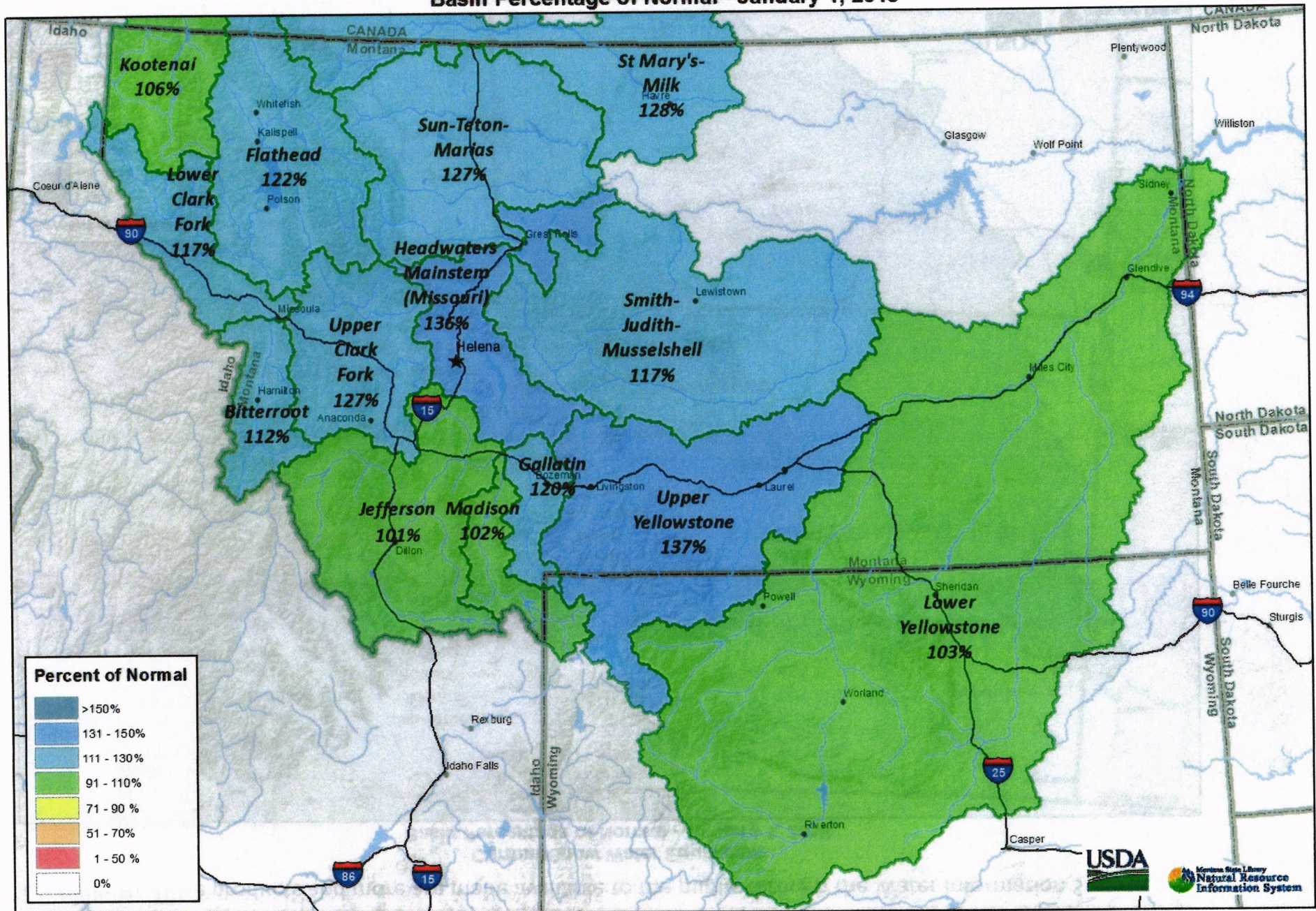
2. Montana Snowpack and Water Supply Maps

In partnership with the USDA NRCS, the State Library provides monthly maps of snow and water supply conditions. These products and more are made available to the public through the Water Information System.



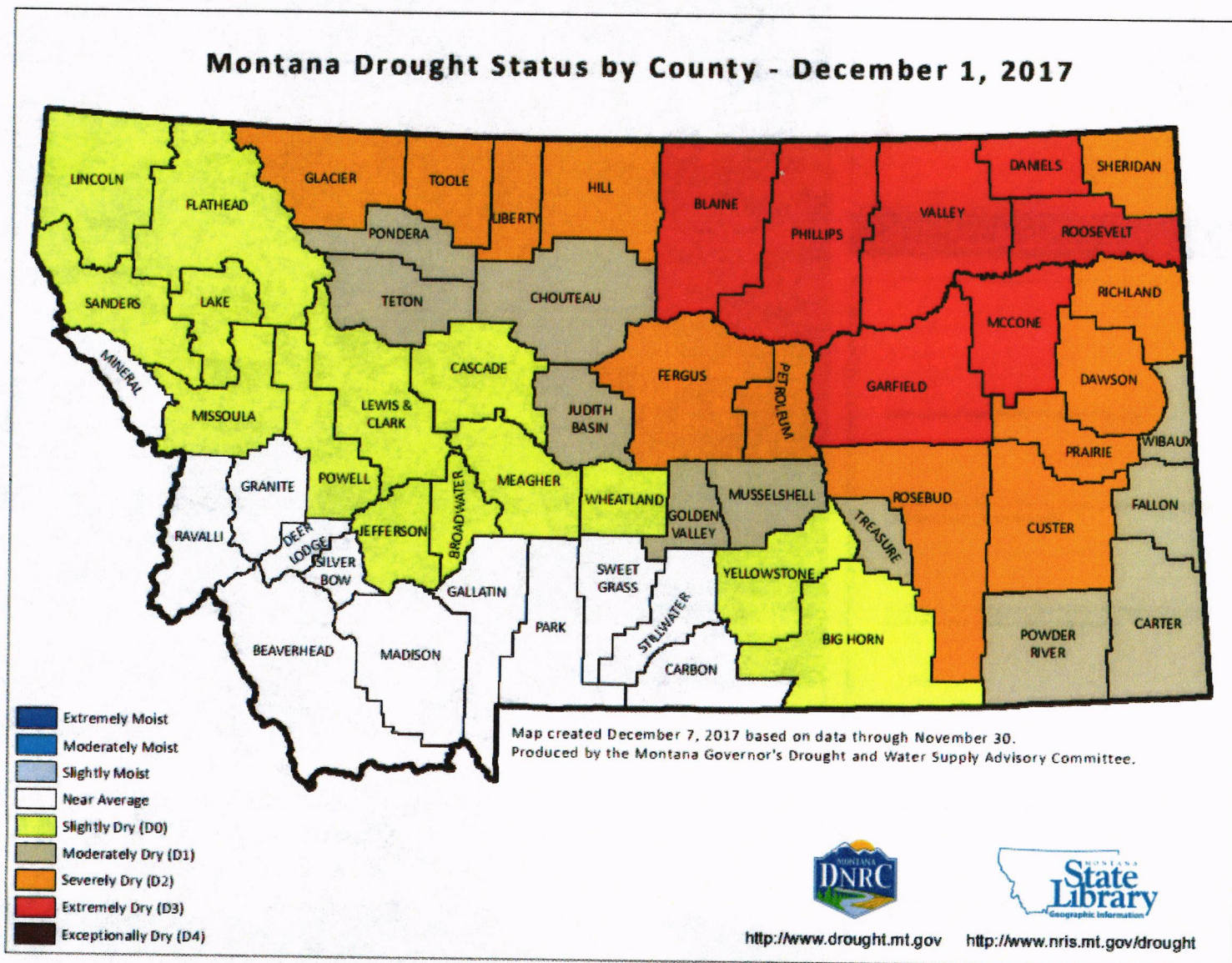
<http://nr.is.mt.gov/water>

Water Year to Date Precipitation Basin Percentage of Normal - January 1, 2018



3. Drought

In partnership with the Governor's Drought and Water Supply Advisory Committee, the State Library produces a monthly Drought Status by County Map and collaborates with state and federal partners weekly to provide input to the U.S Drought Monitor. Additionally, in the summer of 2017, the Montana Drought Impact Reporter, a simple questionnaire to collect reports on the impact of drought from the public, was released (back page).



<http://nris.mt.gov/drought>

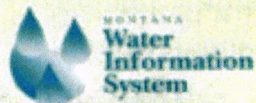
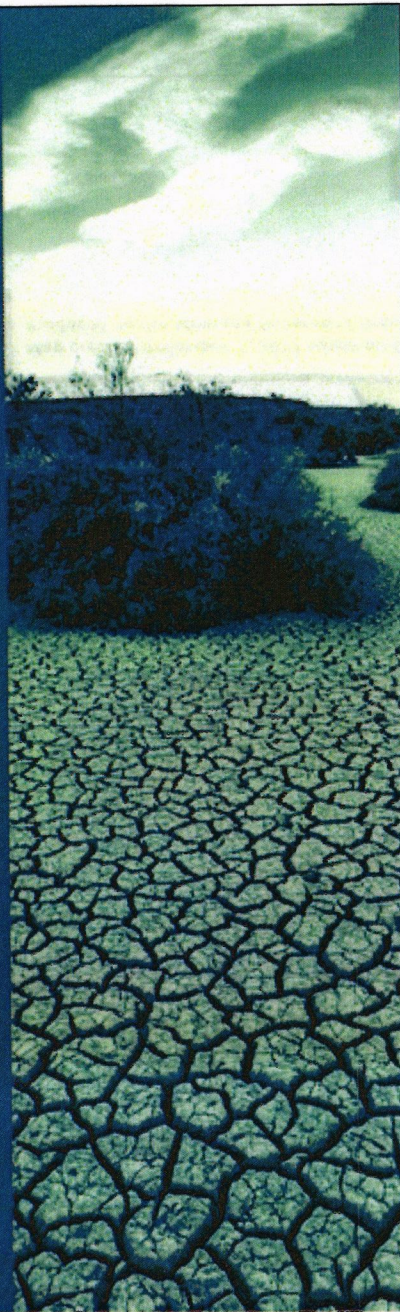
MONTANA DROUGHT IMPACT REPORTER

DROUGHT.MT.GOV

Report on drought
conditions in your
area with a simple
questionnaire

Explore maps and
graphs of reported
drought impacts

View drought status
by county



The Montana Department of
Natural Resources
& Conservation



Name (optional)

John Smith

Organization (optional)

Email Address (optional)

Date *

8/29/17

County where observations were made *

(to submit an additional county please submit an additional survey)

Please Select

Primary Drought Impact Type *

(to submit an additional impact type please submit an additional survey)

Please Select

How many inches of rain in the last month?

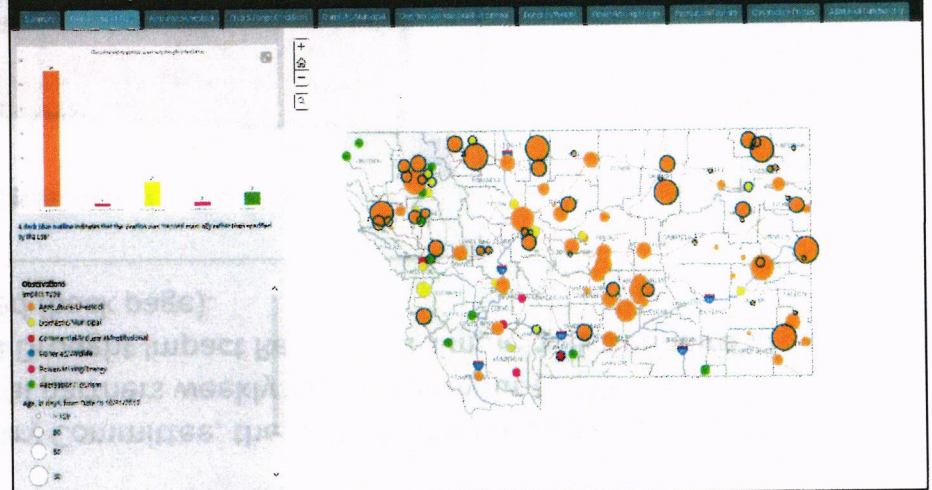
< 0.5

0.5-1

1-1.5

1.5-2

2017 Montana Drought Impacts



4. Yellowstone River Clearinghouse

In partnership with the Yellowstone River Conservation District Council, the State Library provides a single point of access for information about the Yellowstone River Corridor, including interactive maps (back page), GIS data, and publications and reports. These products and more are made available to the public through the Water Information System.

Yellowstone River Clearinghouse

About

This web page provides a single point of access to Yellowstone River data and publications. It is a single point of access for information associated with the River, such as maps, GIS data, and reports. The most recent resources resulted from the Yellowstone River Corridor Comprehensive Study, also known as the Cumulative Effects Assessment. [Read More.](#)

Quick Links to Yellowstone Clearinghouse Resources

- [Interactive Online Map Viewer](#) - explore the most commonly used Yellowstone River GIS layers overlaid on imagery, topographic, or other reference backgrounds.
- [Reach Story Map 1- Explore Yellowstone River Physical Features: Overview](#) (Reach narratives organized by county)
- [Reach Story Map 2- Explore Yellowstone River Physical Features: Details and Recommendations](#) (Reach narratives organized by reach)
- [Cumulative Effects Analysis \(CEA\) Final Report](#)
- [Recommended Practices and Position Statements](#)
- [Imagery](#)
- [LIDAR Elevation Data](#)
- [Land Use Mapping](#)
- [Hydraulic Models](#)
- [Physical Features Inventory](#)

Additional resources are organized by topic and accessed through the links listed in the right panel of this page.

Tags:

[Page History](#) | [Edit](#)

A A A A

Yellowstone Clearinghouse Home

Yellowstone River Final Reports

- [Cumulative Effects Analysis \(CEA\)](#)
- [CEA Technical Appendices](#)
- [CEA Executive Summary](#)
- [Reach Narratives](#)
- [Recommended Practices and Position Statements](#)
- [Governor's Upper Yellowstone Task Force \(1997-2003\)](#)

Maps

- [Online Map Viewer](#)
- [Reach Story Map 1: Overview](#)
- [Reach Story Map 2: Details](#)
- [Yellowstone Reference Maps](#)
- [Maps Selected from Technical Reports](#)

Data and Technical Reports

- [Imagery and Topographic Mapping](#)
- [Hydrology and Hydraulics](#)
- [Land Use and Physical Features](#)
- [Geomorphology](#)
- [Biology](#)
- [Socioeconomics](#)
- [List of Available GIS Data](#)

Contact Info

- [Yellowstone River Conservation District Council](#)
- [Montana State Library Water Information System](#)

<http://nris.mt.gov/yellowstone>

Explore Yellowstone River Features: Reach Details and Recommendations

No issues detected x

Reach B1

Related observations in Reach B1 include:

- Blockage of miles of side channel
- Extensive armoring with CMZ encroachment
- Passive loss of major side channels due to downcutting and flow alterations

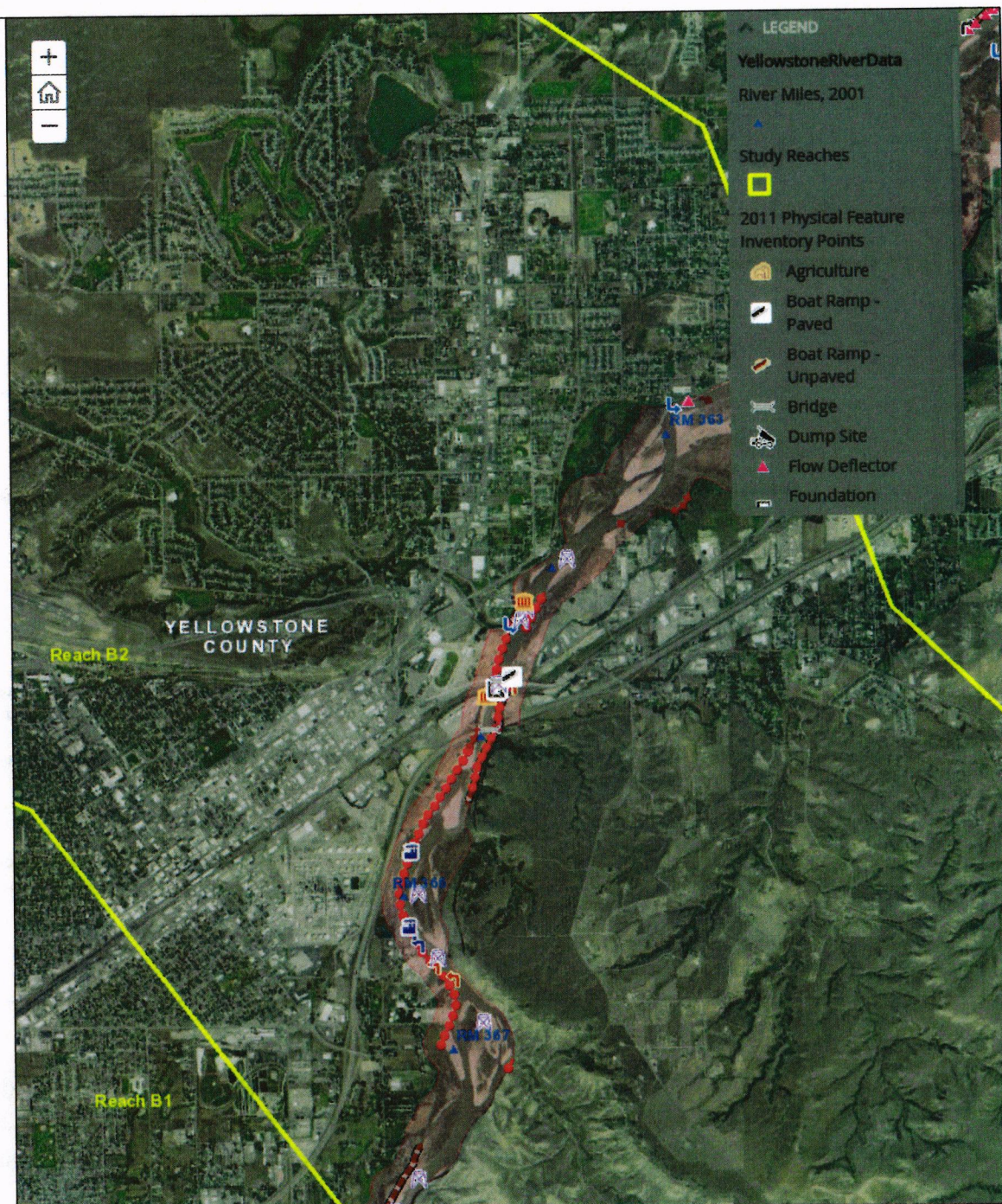
Recommended Practices:

- YRRP 1.2 - Floodplain Restoration - MRL and BNSF Railroad Berms
- YRRP 1.2 - Floodplain Restoration - Public Highways and County Roads
- YRRP 1.3 - Side Channel Blockage Removal - Side Channel Restoration
- YRRP 2.1 - Channel Bank Stabilization - Failed Bank Armor and Flow Deflector Removal
- Side channel restoration at RM 381 and RM 373
- Pipeline crossing management - natural gas pipeline at RM 382
- Flanked armor removal at RM 383, RM 382.3, RM 381.5, RM 380.2, RM 377.8, and RM 373.8
- CMZ management due to extent of current CMZ restriction (25 percent)
- Russian olive removal
- Pipeline management at crossings and also where concrete armor has flanked where idled crude oil pipeline runs parallel to bank at RM 385.1 right
- Nutrient management at corrals that are part of an animal handling facility within 300 feet of river at RM 377.7 just downstream of Duck Creek Bridge.

Reach Narrative:

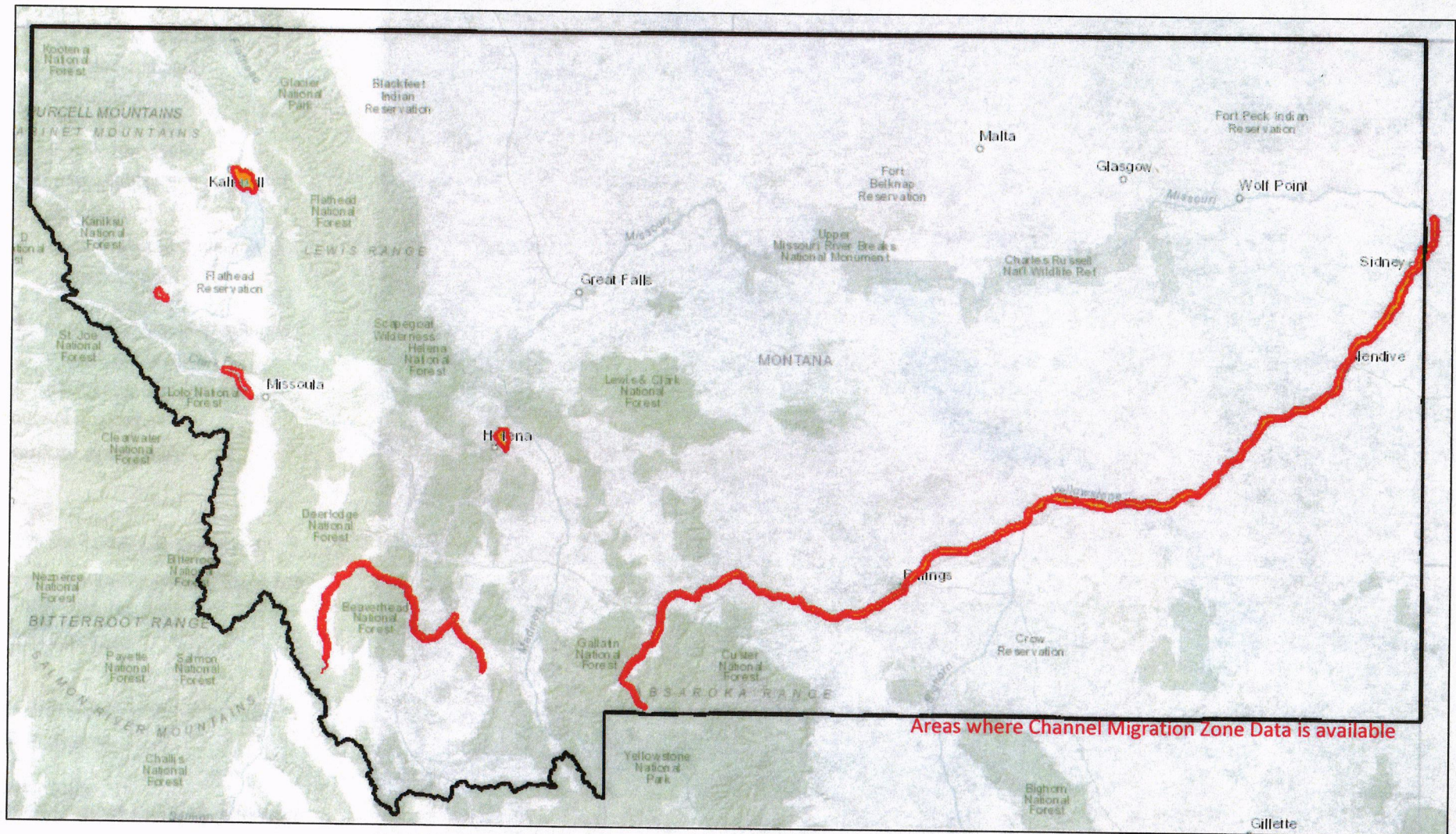
Length 24.6 km

Reach B1, located in Yellowstone County, extends from the

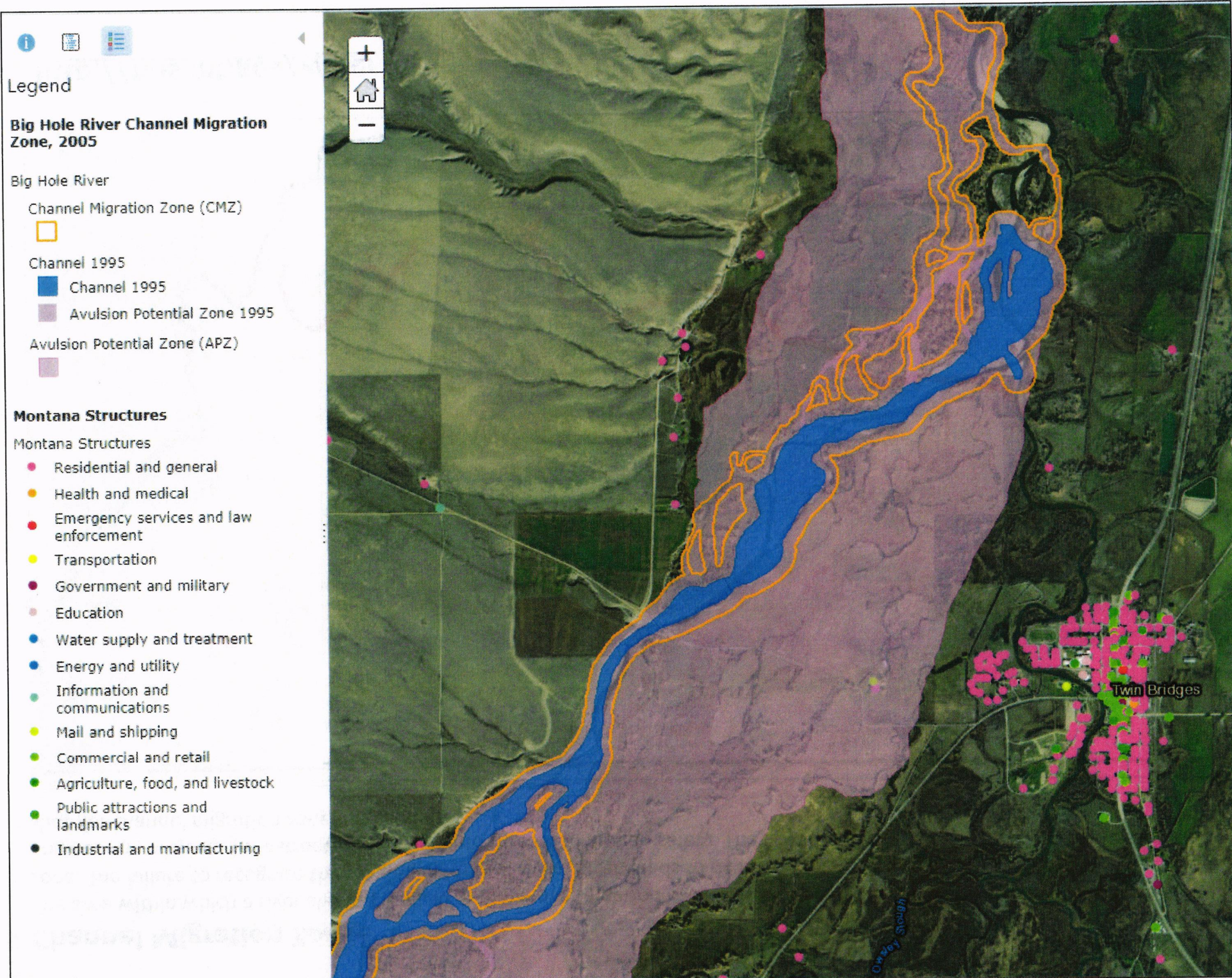


5. Channel Migration Zones

The area within which a river channel is likely to move over a period of time is often referred to as the channel migration zone. The failure to recognize the dynamic nature of rivers often leads to development strategies that result in costly engineering projects, infrastructure damage, and threats to human safety. The Montana State Library provides a one-stop shop for channel migration zone data and maps.



<http://nr.is.mt.gov/water>



Legend

Big Hole River Channel Migration Zone, 2005

Big Hole River

Channel Migration Zone (CMZ)



Channel 1995



Channel 1995



Avulsion Potential Zone 1995

Avulsion Potential Zone (APZ)



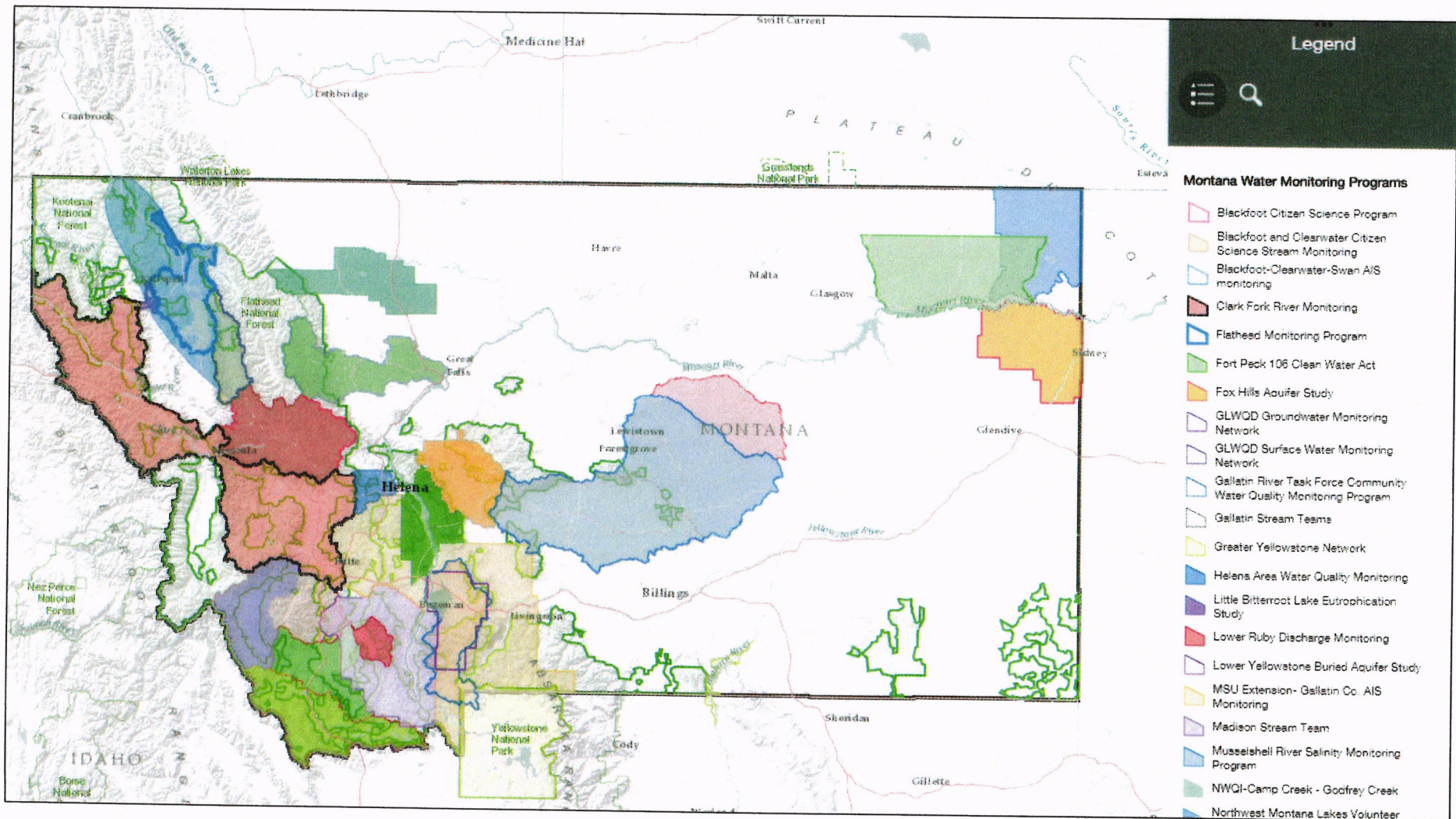
Montana Structures

Montana Structures

- Residential and general
- Health and medical
- Emergency services and law enforcement
- Transportation
- Government and military
- Education
- Water supply and treatment
- Energy and utility
- Information and communications
- Mail and shipping
- Commercial and retail
- Agriculture, food, and livestock
- Public attractions and landmarks
- Industrial and manufacturing

6. Map of Water Monitoring Programs

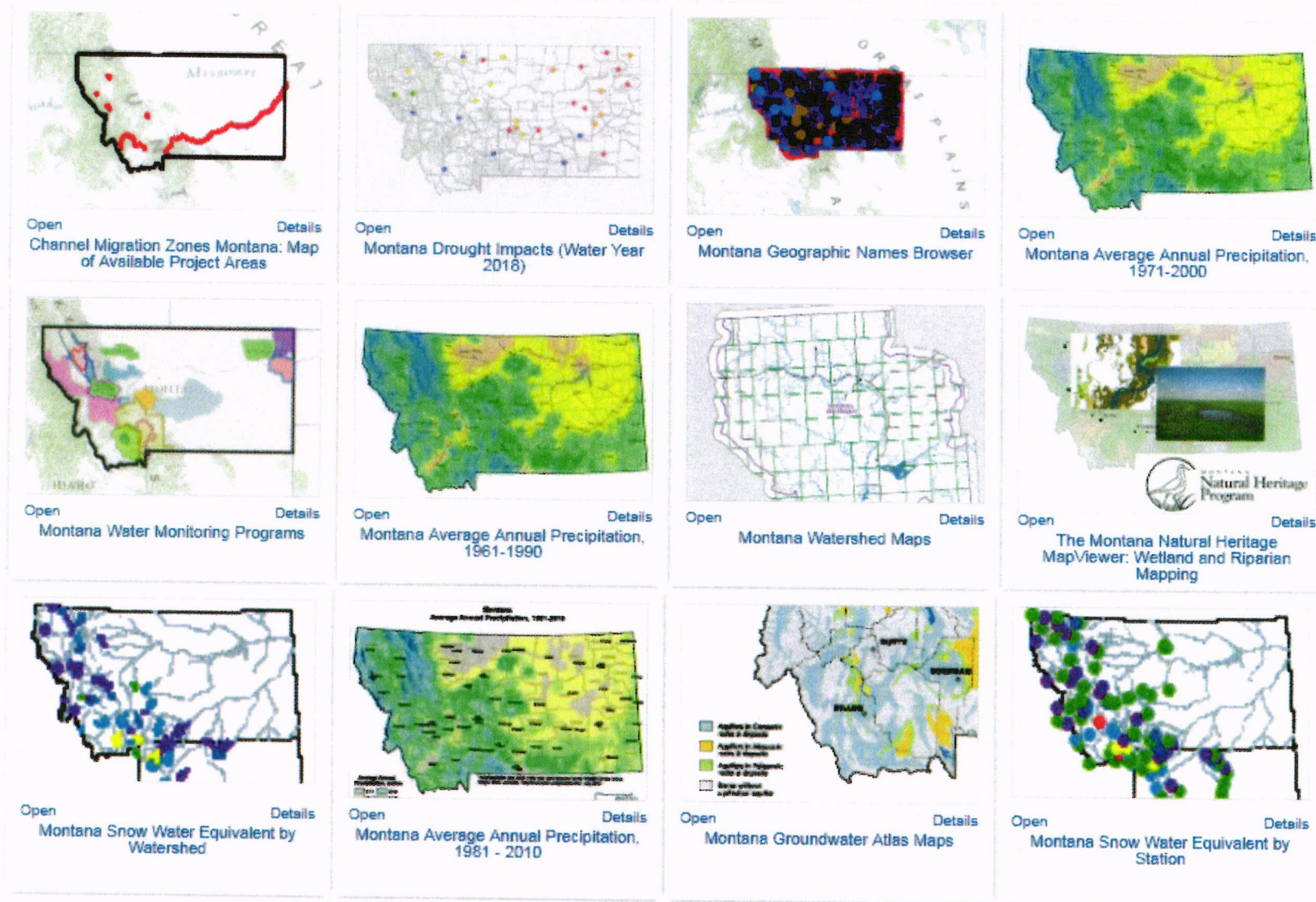
In partnership with the Montana Watershed Coordination Council, the Montana State Library provides a map and GIS database of water monitoring programs across the state. This interactive map provides a brief description of the organization, lists the water monitoring objectives, and provides a link to the organization's website.



<http://mtwatersheds.org/app/water-monitoring>

7. Digital Gallery of Water Maps

The Montana State Library's Geographic Information System (GIS) program strives to make geospatial information available to all, not just those with the expertise and software. Readily available for download through the Water Information System are dozens of pre-made maps and approximately 60 water-related GIS datasets, many of which are viewable through online applications.



<https://mslservices.mt.gov/Maps>